Dynamic Investment Models, Employment Generation and Productivity – Evidence from Swedish Data

av

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Abstract

***Paper 1**: Effects of shocks and uncertainty on capital and labor in a real options model with variable capacity utilization*

This study analyzes the effects of uncertainty on investment, capital use and labor demand, in both the short run and the long run, in dynamic capital models where firms have incentives not to operate at full capacity. We have modified the real options model with full irreversibility to incorporate variable capacity utilization. After obtaining a numerical solution to the investment function, we analyze the difference in the prediction between the real options model with full capacity and our models. In the short run, the firm is less cautious for new investment and accumulates more capital than in a real options model with full capacity utilization. In the long run, the firm tends to build a larger capital stock while capital use declines as uncertainty increases. This suggests inefficiency in the form of excessive capital accumulation. Implications for labor demand are also discussed.

***Paper 2**: Capital adjustment under variable capacity utilization*

This study generalizes the existing real options model so as to accommodate fluctuations in capacity utilization, and then analyzes the effects of uncertainty in this modified model. Using both simulated data and Swedish 2-digit sectoral data for the manufacturing industry, we show that the main argument of the real options model – that the responses of the capital stock to demand shocks are weaker at higher levels of uncertainty – still holds, implying that policy stimuli have limited effects on investment in the immediate aftermath of an uncertainty shock. On the other hand, we find that actual capital use (active capital) flexibly responds to demand shocks through adjustments of capacity utilization even at high levels of uncertainty, which suggests that policy stimuli have positive impacts on production activities even at high uncertainty.

***Paper 3**: Are larger firms more productive because of scale economies? – Evidence from Swedish register data*

This study investigates the factors driving higher labor productivity for large firms, using Swedish register-based microdata for the mining and manufacturing industries covering more than 28,000 firms during 1997-2006. We estimate translog production functions using dynamic panel approaches and the approach proposed by Ackerberg, Caves, and Frazer. The results show that micro and small firms operate under (locally) increasing returns to scale while medium and large firms face decreasing returns to scale. Scale elasticity decreases from 1.15 to 0.97, suggesting that scale effects are not the answer to our question. Further investigation shows that production technology is approximated by a non-homothetic function and that larger firms operate with more capital-intensive technology while the factor price ratio is constant, which drives the productivity difference in favor of larger firms.

***Paper 4**: Employment generation and productivity contribution of entrepreneurial firms compared to large incumbents*

Previous studies have reported that young and small so-called entrepreneurial firms have disproportionately large impacts on both employment generation and productivity growth. However, these positive impacts are conditional on the firms' survival. Many studies show that young and small firms have high mortality. In our study, we investigate the contributions of entrepreneurial firms to employment generation and productivity growth after taking the high mortality into account. We find that, although young and small firms are less likely to survive, they contribute more than other firms to both employment generation and aggregate productivity, simply because the survivors perform eminently.

***Paper 5**: Initial firm size and post-entry growth in size and productivity*

Previous studies show that smaller entrants exhibit higher growth rates in terms of size (number of employees). Using register-based firm-level data for the Swedish mining and manufacturing industries, this study compares the development in size and productivity between a group of firms that started their business in 1998 and a group of firms that had been in business for at least 10 years in 1998. The results show that there is also a similar negative relationship between firms' initial size and post-entry productivity development. The average total factor productivity of the entrants is initially 15 percent lower than that of the incumbents and the difference becomes insignificant after three years. Regarding the growth pattern conditional on initial size, the entrants with one initial employee caught up with the incumbents of similar initial size already in the second year, and gained a lead in the fifth year. It takes three years for the productivity gap between the entrants with 10 initial employees and the incumbents with the same size to disappear. The entrants with more than 20 initial employees never caught up with the entrants of the same size during the nine years analyzed in this study.

Keywords: uncertainty, capacity utilization, real options model, firm-level panel data, economies of scale, non-homothetic production function, entrepreneurial firms, employment generation, productivity, post-entry performance
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